IV

FURTHER INVESTIGATIONS INTO THE CAUSATION OF STRICTURE OF THE URETHRA IN GONORRHŒA

By A. O. ROSS, M.D., D.P.H.

Definition.—In the series of cases under review stricture has been diagnosed where organic obstruction to the passage of a sound along the anterior urethra has occurred and where subsequent urethroscopy has corroborated.

(1) The accepted causes of stricture as a sequela of gonorrhœa are: Injudicious treatment leading to long-continued urethritis [1, 2]; recurrent infection [3]; urethral trauma during the acute and subsiding stages of the disease [4, 5]; infiltrations having their origin around the mouths of the ducts of Littré's glands, stricture being likely to occur at the sites where drainage of retained inflammatory exudates is bad, chiefly at the bulbo-membranous junction [6]; urethral abscess.[7]

(2) Syphilis alone may cause stricture of the urethra by cicatrisation of a chancre occurring in the first ½ inch of the urethra,[8] or by cicatrisation of gummata in the same region.[9]

The writer, in a previous article,[10] attempted to show that stricture of the urethra occurs more often (78 per cent.) in cases where infection with syphilis was coincident with, or in some cases preceded, infection with gonorrhœa. A series of 50 cases was reviewed briefly, and it was stressed that in all cases of stricture, syphilis ought to be suspected and a blood Wassermann should be performed, followed by a provocative dose of "914" if necessary, and repeated. Since then I have treated some 2,500 cases of venereal disease, and have diagnosed stricture in 38 cases.

Ninety-four negroes attended for treatment, and stricture was found in 9 cases, although it has been stated that negroes are not commonly troubled with stricture of the urethra.[11]

Of the 38 cases of stricture seen, one was obviously

traumatic. An external cicatrix ran across the scrotum, and immediately subjacent a urethral stricture of remote origin was discovered. The patient was infected with gonorrhœa for the first time four months before the date of his first attendance. He has not been included in any of the tables.

TABLE I

Ten cases of urethral stricture who gave no history of syphilis and whose blood Wassermann was returned as "negative" and in whom there were no signs of syphilis.

Patient's No.	Date of previous infections.		Duration of present infection.	Littritis.	Results of W.R.				Site of Stricture. Inches from Meatus.	Remarks.
	Gon.	Syph.			1	2	3	4		
C 331	1925	Nil	4 weeks	+	−	−			3	Early treatment by syringe.
C 522	6 mos. prev.	Nil	9 ,,	+	−	−			4	Do.
C 617	Nil	Nil	9 ,,	+	−	−			2½	Treated by syringe and capsules.
D 66	1913	Nil	10 ,,	+	−	−			2	Early treatment by syringe.
D 193	Nil	Nil	5 years	+	−	−			3	Symptoms of stricture. Treated by syringe and capsules.
E 308	Nil	Nil	22 days	+	−	−			1½	Peri-urethral abscess at 1½ in.
C 706	Nil	Nil	3 months	−	−				5½	Attended on three occasions only (negro).
D 545	1908	Nil	1 month	−	−				2½	
D 871	1926	Nil	1 year	−	−				5½	Symptoms of stricture. Ceased attendance after one week.
D 904	1917	Nil	1 month	−	−				5½	Attended only till stricture was discovered.

Summary of First 6 *Cases.*—In all 6 cases definite palpable Littritis is mentioned. In 5 of these mention is made of the use of the small syringe. In 5 the stricture occurred in the first 3 inches of the urethra. In 1 case a peri-urethral abscess developed on the twenty-second day of the disease (pre-Wassermann stage).

Summary of Last 4 *Cases.*—In 3 cases attendance was of brief duration and only one Wassermann test was possible. In these 3 cases, stricture occurred at the bulbo-membranous junction.

Of the 10 cases, 6 gave a history of former infection. In 8 cases the duration of the present infection was less than one year, and in 2 cases one year or more.

TABLE II

Nine cases where a history of syphilis was obtainable, or where signs of syphilis were present.

In all these cases stricture was present at the bulbo-membranous junction. In 2 cases a former infection

with gonorrhœa was admitted, and in the remainder the present infection had existed for one year or more.

Patient's No.	Date of previous infections.		Duration of present infection.	Lit-tritis.	Results of W.R.				Site of Stric-ture. Inches from Meatus.	Remarks.
	Gon.	Syph.			1	2	3	4		
C 931	Nil	Con-genital	2 years	—	—				5	Stigmata. Hutchinson's teeth, sad-dle nose, etc. Symptoms of stricture.
C 994	Nil	1922	5 ,,	—	—				5	W.R. positive three months pre-viously. Five attendances.
D 61	Nil	Nil	15 ,,	—	++				2½ & 5½	Gummata at root of penis. Symp-toms of stricture (negro).
D 81	Nil	1921	6 ,,	—	++				5½	One attendance. Symptoms of stricture (negro).
D 911	Nil	1914	8 ,,	—	—	+	+		2 & 5½	
E 54	1922	1922	3 months	—	—	—	—		5½	Crusted nodules on glans responded to " 914 " treatment.
D 576	1925	6 mths.	6 months Sy.	—	++	++			5½	Early secondary syphilide on trunk when treated for syphilis originally
E 149	Nil	1905	24 years	—	—				5½	Attended on one occasion.
E 503	Nil	1900	29 ,,	—	—	—P.	—	—	5½	Provocative " 914 " given.

TABLE III

Eighteen cases who gave no history of syphilis and who showed no signs of syphilis, but where the blood Wassermann was " positive."

Patient's No.	Date of previous infections.		Duration of present infection.	Lit-tritis.	Results of W.R.				Site of Stric-ture. Inches from Meatus.	Remarks.
	Gon.	Syph.			1	2	3	4		
B 957	Nil	Nil	11 years	—	—	+	+		3	Symptoms of stricture.
C 71	Nil	Nil	4 ,,	—	++				5½	Two attendances after W.R. result.
C 238	Nil	Nil	3 ,,	—	+				5½	Perineal sinus (negro).
C 381	Nil	Nil	18 weeks	—	—	+	++		3	Stricture resolved under " 914 " treatment. Reported August, 1927, W.R. —. Stricture dis-covered November, 1927, W.R. +.
C 616	Nil	Nil	5 months	+	+				3½	
C 624	Nil	Nil	22 years	—	+				3	Stricture resolved under " 914."
C 726	Nil	Nil	21 ,,	—	++				5½	Four attendances only. Symptoms of stricture.
C 748	1925 2 yrs.	Nil	3 months	—	+				2	Five attendances only. Symptoms of stricture (negro).
C 749	Nil	Nil	9 years	—	+	—	—		3	Stricture resolved under " 914."
C 875	Nil	Nil	3 months	—	+	+	+		2	
C 937	? Nil	Nil	?1 week	—	++				4½	Attended for four days only (negro).
D 148	Nil	Nil	1 year	—	++				4½	Four attendances (negro).
D 268	Nil	Nil	1 year	—	++				5½	Did not attend after blood was taken (negro).
D 369	Nil	Nil	?	—	++				3½	One attendance only. Symptoms of stricture (negro).
D 419	Nil	Nil	6 months	—	—	+	+		5½	Second W.R. taken six months after first W.R.
D 787	1925	Nil	6 weeks		++	++			4½	
E 97	Nil	Nil	7 years	—	—	—	++	++	5½	Provocative after second negative W.R. Stricture resolved under " 914."
E 481	? Nil	Nil	8 weeks	—	+				5½	Symptoms of stricture (negro).

In all cases treatment by dilatation with sounds and Kollmann dilators was carried out while antisyphilitic treatment was being given. " Resolved under '914' treatment " means that resolution was more rapid than expected from dilatation treatment alone.

Summary.—In 7 cases the patients were West African negroes and histories are difficult to obtain from this type. One of them gave no history of any infection, but came for relief of his retention. Another gave a history of one week's sickness. Littritis was noted in 1 case. In 8 cases stricture was found at the bulbo-membranous junction, and in three cases immediately anterior thereto. In 6 cases stricture occurred in the penile portion. In 2 cases a history of former gonorrhœa was given, and in 9 cases the present attack was stated to have existed for one year or more.

In no case was there reason to suspect the existence of any condition other than syphilis as a cause of the positive reaction.

Thus, in the series of 37 cases, 73 per cent. were syphilitic and 27 per cent. non-syphilitic.[14]

Of the non-syphilitic group it is interesting to note that 6 of the 10 had a definite Littritis, and 5 of these had been treated by the small hand syringe during the first attack of gonorrhœa. There would appear to be no doubt that, as was noted by Luys,[12] Littritis is commonly caused by the use of the small hand syringe, probably because it is used by the patient without supervision, and strong solutions of antiseptics at too low a temperature are used. Possibly also the small hand syringe fails to dilate the anterior urethra properly and the Littré glands are allowed to become occluded by inspissated pus or otherwise.

In 5 of the 6 cases with Littritis the stricture occurred in the penile portion of the urethra and was probably caused by peri-glandular fibrosis. In only 2 of the 10 was the gonorrhœa stated to have existed for one year or more, but 6 gave a history of a former infection.

In 3 cases only was the stricture at the bulbo-membranous junction.

In the syphilitic group mention of Littritis is made on one occasion.

In 17 out of 27 cases the stricture occurred at the bulbo-membranous junction, and in 3 others it was placed immediately anterior to that point.

Of the cases classed as syphilitic, 9 had a history or signs of syphilis, while 18 had neither history nor sign of that disease. Six of the latter were negroes, and secon-

dary syphilides are apt to be missed on these men. If these cases are not included it is still worthy of note that in 12 cases of stricture out of 31 no signs of syphilis were noted at any time, but the blood Wassermann reaction was positive.

In 1,250 consecutive persons suffering from venereal disease during the last nine months a sample of blood was taken for the Wassermann test. Of this number 792 were apparently simple cases of gonorrhœa, but the blood was returned as positive in 34 cases (4·3 per cent.). Corroboration of this report was obtained if possible by sending a further specimen of blood for test.

It would appear that coincident infection with syphilis and gonorrhœa results in the primary and secondary signs of syphilis being masked in a certain number of cases.[10, 13] Is it possible that alterations in the mucous membrane through which the treponema may enter (*e.g.*, the endometrium in conceptional syphilis and the urethra in gonorrhœa and syphilis) results in a failure of the body to react in characteristic fashion by primary (including chancre in urethra) and secondary external lesions ?

Summary

Stricture in this series has been associated with long-continued infection (ca. 50 per cent.) ; with recurrent attacks of gonorrhœa (ca. 27 per cent.) ; with severe infection of Littré glands (ca. 20 per cent.) and with trauma in so far as this latter condition indicates ill-administered treatment.

Syphilis has been associated in 73 per cent. of cases and may be a contributory factor, either indirectly by reducing the resistance of the body to the gonococcus and secondary organisms and thus prolonging the disease, or directly by causing a definite sclerosis where retained inflammatory exudates act as an excitant—*ubi stimulus, ibi lesio.*

Browning and Mackenzie,[14] referring to " Clinical Applications of Serum Reaction," state : " A positive reaction proves that an individual is syphilitic ; but it does not prove that any given lesion has a syphilitic basis. Hence clinical and other evidence must always be considered along with the serum reaction in determining the syphilitic nature of a disease."

Total asymptomatic syphilis has been present in about 50 per cent. of cases of stricture, and in a series of 792 apparently simple cases it has been found in only 34 cases = 4·3 per cent.

From that evidence, and by reason of the undoubted therapeutic effect of anti-syphilitic treatment on strictures of the urethra associated with a positive serum reaction, I am convinced that the majority of strictures of the urethra are syphilitic. Therefore it should be part of the routine in a venereal diseases clinic to investigate the serum reaction of all cases of gonorrhœa at their first attendance, and again before a final pronouncement of cure is given, or alternatively at the end of the fourth month of treatment.

Where stricture is found at any time in the course of investigation of the urethra, and especially when it is found at the bulbo-membranous junction, care should be taken to eliminate the possibility of syphilis by clinical and serological examination. A provocative dose of novarsenobenzol should be given and the blood taken at the approved periods.

Generally speaking, it would appear that, apart from chemical and physical trauma of the urethra, strictures can be divided into two classes :—

	Non-syphilitic Group.	Syphilitic Group.
Site.	*Pars mobilis urethra*, 70%	*Pars fix a urethra*, 74%
Histology.	Glandular.	Submucous.
Association with a single long-continued attack.	Few, 20%	Many, 64%*
Association with recurrent attacks.	Many, 60%	Few, 16%*
Etiology.	Gonorrhœa complicated by treatment with the small hand syringe.	Gonorrhœa complicated by syphilis.

* Excluding two negroes whose history was obviously erroneous.

Prophylactic treatment of stricture therefore should follow two main lines :—

(*a*) In no case of acute gonorrhœa should treatment by the small hand syringe be countenanced.

(*b*) All cases of gonorrhœa should be examined carefully both clinically and serologically to exclude syphilis at the date of their first attendance and again four months later.

REFERENCES

(1) THOMSON WALKER. " Genito Urinary Surgery," 1914, p. 623.
(2) GUYON and FINGER, quoted by Horwitz. *Keen's Surgery*, 1909, Vol. IV., p. 543.
(3) FREYER. " Stricture of the Urethra," p. 12.
(4) PELOUZE. " Gonococcal Urethritis in the Male," p. 128.
(5) FREYER. " Stricture of the Urethra," p. 13.
(6) LEES. " Diagnosis and Treatment of Venereal Diseases," p. 505.
(7) FREYER. " Stricture of the Urethra," p. 13.
(8) THOMSON WALKER. " Genito-urinary Surgery," 1914, p. 623.
(9) DOBLE, F. C. *British Journal of Venereal Diseases*, July, 1927, p. 175.
(10) ROSS, A. O. *British Medical Journal*, August 13th, 1927.
(11) WHITE and MARTIN. " Genito Urinary Surgery and Venereal Diseases," 1917, p. 247.
(12) LUYS. " Gonorrhœa," 1918, p. 193.
(13) NABARRO, D. N. *British Journal of Venereal Diseases*, July, 1927, p. 220.
(14) " Recent Methods in the Diagnosis and Treatment of Syphilis," 2nd edition, p. 254.

I am indebted to Dr. A. A. Mussen, Medical Officer of Health, City and Port of Liverpool, for permission to publish the above article.